**Experiment 7**

 **Examine the Two Stage up-conversion using MATLAB R2007a.**

**Objective:**

**Simulink Model:**

**Theory:**

A double up-conversion modulator includes a first conversion stage (**1**) formed of two modulation units receiving at one input quadriphased baseband signals, controlled by four quadriphased carrier signals at a first intermediate frequency (IF**1**), and delivering at one output opposite up-converted signals at said first intermediate frequency. The modulator further includes a second up-conversion stage (**2**) receiving at one input said up-converted signals at said first intermediate frequency, controlled by two other in phase opposition carrier signals at a second intermediate frequency (IF**2**), and delivering at one output a high frequency signal , said high frequency (HF) corresponding to the sum of said first and second intermediate frequencies (IF**1**+IF**2**).

Quadrature double frequency up-conversion modulator, used in particular in transmitter circuits for mobile telephones. The double up-conversion modulator includes a first frequency up-conversion stage formed by a first modulation unit. This first modulation unit receives at one input baseband quadriphased signals, formed of a first in-phase signal, a second in phase opposition signal, a third in quadrature signal and a fourth in quadrature-opposition signal. This first unit is controlled by carrier signals quadriphased at a first intermediate frequency formed by a first in-phase carrier signal, a second in phase opposition carrier signal, a third in quadrature carrier signal and a fourth in quadrature-opposition carrier signal. The modulation unit delivers a signal up-converted to the first intermediate frequency at one of its output

**Procedure:**

1. Open the Matlab and then open the Simulink.
2. Draw the model after that start the simulation.
3. Note the different graph of modulation and demodulation which appears on window.
4. Then check the results which obtained from the graph.

**Conclusion:**

**Q1) What is BB spectrum?**

**Q2) What is double up conversion modulator?**

**Q3) What is Quadrature double frequency up-conversion modulator?**

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**Output**

**Assessment Sheet:**

**Name: ----------------------------------------------------**

**Registration No: --------------------------------------**

**Lab No: --------------------------------------------------**

**Date: -----------------------------------------------------**